

is metallic grass-green; the lower back and rump are dull azure-blue instead of pale bluish grey; the sides of the head and throat dingy bluish green instead of pure white; the remainder of the lower parts is bluish white, more whitish in the middle, decidedly tinged with bluish green on the flanks; the feathers of the chest are black with the slightly attenuated tips bluish white, but there is no trace of the golden yellow tinge, so conspicuous a feature in *C. palmeri*; the lesser wing-coverts, bluish grey in the latter, are metallic azure blue, more greenish blue at the tips, and shading into violet towards the edge of the wing; the edges of the median and greater wing-coverts, as well as those of the remiges and rectrices, are dull azure blue in *C. cabanisi*, bluish grey in *C. palmeri*. In the former the base of the lower mandible is pale brown, while the latter has the bill entirely black.

The type of *C. palmeri* (from which the figure (Pl. V.) is taken) is in the Zoological Museum of Munich.

XIV.—*On the Great Invasion of Crossbills in 1909.*

By JOSEPH I. S. WHITAKER, F.Z.S., M.B.O.U.

THE following notes are the results of an inquiry which I have attempted to make regarding the exceptional, and, so far as regards recent years, I may say unprecedented, invasion of the Common Crossbill (*Loxia curvirostra*), which has occurred during the past summer and autumn throughout a considerable portion of Europe. This inquiry, I may at once observe, has no pretension to being a searching or exhaustive one. It was, indeed, my original intention to write of the Crossbill invasion so far as regards Italy alone, but the consideration that it was a matter which concerned the whole of Europe has induced me to extend my remarks to the wider sphere.

As in the case of Pallas's Sand-Grouse (*Syrnhaptes paradoxus*), partial, although occasionally very considerable, migrations of the Crossbill occur, from time to time, at

irregular intervals, varying greatly in their numerical importance, as well as in their extension and duration. The invasion of the past year, however, has been of such magnitude and so wide-spread that it cannot fail to have attracted the attention of most ornithologists in our own country, as well as abroad.

So far as I am aware, no Report of a comprehensive nature, embracing the whole of the European Continent, has as yet been published regarding this highly interesting ornithological event, although I understand that at least one such Report is in course of preparation on the Continent, and we may therefore shortly expect to be placed in possession of full details and much valuable information on the subject. Meanwhile I may say that some interesting local notes and letters regarding the course and progress of the invasion have appeared from time to time during the past few months, in England as well as on the Continent, and some noteworthy particulars have been obtained and recorded concerning it.

Foremost among these particulars, so far as relates to our own country, may be mentioned those published in 'British Birds,' and specially some notes by Mr. H. F. Witherby in the November and December parts of that journal, the latter, moreover, being accompanied by a series of maps, cleverly drawn up by Commander Lynes, illustrating the extent and progress of the invasion of Crossbills in the British Islands. Letters have also appeared from time to time in the 'Field' recording the occurrence of this species in various parts of the United Kingdom and abroad*.

In Germany, as well as in Austro-Hungary, and generally, I may say, throughout Central Europe, our brother ornithologists have not been idle in collecting notes and information regarding the unusual appearance of Crossbills in their respective countries.

In France an inquiry into the subject was opened in the columns of the 'Revue française d'Ornithologie' last autumn, and some interesting information has been obtained.

* The details given in the 'Annals of Scottish Natural History' for 1909 and 1910 should also be consulted.—EDD.

In Italy articles and letters recording the extent and progress of the Crossbill invasion in that country have been published in the Journal 'Avicula,' in the 'Bulletin' of the Italian Zoological Society, and in some local newspapers, and further information, it is to be hoped, may still be forthcoming, not only from that country, but also perhaps from other parts of South Europe.

Before giving the statistics which I have been able to obtain regarding the occurrence of Crossbills in various parts of the Continent, I wish to make a few remarks of a general character concerning the subject in question, and specially with reference to the following points connected with it, viz.: the cause which has determined or brought about this erratic migration or wandering of the species; the country or countries from which the birds have chiefly come; and, lastly, the influence or governing force, if there be any, which has regulated the course, expansion, and duration of the migration.

Taking these points in the order above-mentioned, and commencing with that of the cause of this unusual movement on the part of a species not a true or regular migrant, the reason which naturally first presents itself to one's mind is that of a scarcity of food in the bird's habitual range; and this, I venture to think, is probably the right one.

The Crossbill, as is generally known, is at times a veritable vagrant or gipsy among birds, as it has somewhat appropriately been styled, its roving on such occasions being apparently influenced by a lack of sufficient nutriment in the northern coniferous forests which are its chief home; and this failure in its natural food-supply has probably been the cause of the species wandering in the present, as it has doubtless been in previous instances.

The exceptionally severe weather that prevailed throughout a considerable portion of the European Continent during the previous winter and spring months probably interfered with the development and ripening of the cones in the northern pine and fir woods, and brought about this failure in the bird's principal food.

Professor Robert Collett, of the Zoological Museum at Christiania, in reply to my inquiry, has kindly written to me on the point as follows:—

“For several years there has *not been a good cone-year* for the spruce-fir in Norway, and the Crossbills have been very scarce with us for several years. This summer we observed small flocks of *L. curvirostra* in the beginning of July, not earlier. In the course of the month they totally disappeared, and we have not seen them since. They tried to eat the young green cones of the Larches in the gardens. I did not observe them in the forest, but heard that some were seen there, but the flocks have never been great with us this year. I should think that the wandering swarms came from the east.”

The tardy ripening, or even in some cases the absolute lack, of the Crossbills' main sustenance was probably more or less general last year, not only in Northern Europe, but in the coniferous forests further east and south. Even from Italy reports of the scarcity of fruit on the pine- and fir-trees have been recorded. Prof. A. Bonomi, of Rovereto (Trent), writes that in that district, owing to the tempestuous weather experienced in the preceding spring, as he had himself ascertained by personal observation, the coniferous woods were absolutely bare of fruit. Even so far south as Sicily vegetation generally was in a most backward state last year, owing to the severities of the previous winter and spring.

On the whole, there appear to be good grounds for supposing that the Crossbills' food-supply was deficient last year throughout the whole of the species' true habitat; and until some better reason can be assigned for it, I think we are justified in considering that fact to be the reason of the birds wandering from their home.

The theory of an unusually prolific breeding-season having driven a considerable number of the birds to seek a home elsewhere is hardly to be entertained, nor could it, I may venture to think, suffice to account for the extraordinary migration experienced last year.

With regard to the country or countries from which the

vast legions of Crossbills last year migrated and spread over the greater part of Europe, appearing even in districts where the species had rarely been observed before, it is difficult, not to say impossible, to single out any one particular locality as the base or centre of the movement. It is indeed presumable, particularly bearing in mind its extent and proportions, that this migration had its origin generally throughout a large tract of country, the coniferous forests of which had all been equally affected by the inclemency of the past winter and spring. Under the circumstances, therefore, I think we may look upon the movement as having originated throughout the entire northern portion of Europe, and probably still farther eastward, possibly even as far as Siberia.

The presence of occasional examples of the Two-barred Crossbill (*Loxia bifasciata*) among the wandering flocks of the commoner species, although not conclusive, would point to there having been at least *some* migration from the more eastern portion of North Russia and probably also from Asia.

The third point to which I have alluded, viz. the possibility of a guiding influence which may have directed the course and progress of the species' movements, is, no doubt, a matter for conjecture. Has there been any such influence, or have the birds, once started on their journey in search of food, wandered at random from district to district, whithersoever caprice may have taken them, and after exhausting the supply of food in one locality, moved on to another, until they found a fresh store? The latter conjecture is possible, and the fact of the birds remaining in certain localities where food was abundant for a considerable length of time is in favour of the argument; but, on the other hand, it seems hard to believe, and it is more natural, I think, to suppose that, as in the case of ordinary or regular migration, some instinct has guided the birds on their journey, and brought them back again safely to their homes. It is presumable, at least, that most, if not all, the surviving wanderers will eventually return to their native home, if they

have not already done so, and there find an abundant supply of food awaiting them in the tardily ripened cones.

With regard to the extent of last year's migration, it may be said to have embraced practically the greater part of Europe, having reached southward as far as the Mediterranean, expanding laterally on both sides, east and west, almost as far, perhaps, as the limits of our Continent. The migration does not appear to have extended to any part of North Africa, although the Italian Islands in the Mediterranean, and even Malta, were visited by the birds in considerable numbers. Thinking it likely that some of the wanderers, being so near the African coast, might have crossed over to Tunis, I wrote to M. Blanc of that city in July and again in October, inquiring if any Crossbills had been observed there, but the reply on both occasions was in the negative. Had any of the birds crossed over to Tunis I think that they would not have escaped the notice of the sharp-eyed Arab bird-catchers; and they could hardly have been confused with the local subspecies, *L. curvirostra poliogyna*, which inhabits the higher mountains of the interior and does not approach the coast.

Judging from the reports so far received, the migration, although fairly general throughout Europe, seems to have been more conspicuous in the central and eastern portion of the Continent than further west, but, looking at the map, this seems only natural. What at first sight strikes us as rather remarkable is that the small islands, both those off our Scottish coast, as well as those in the Mediterranean, some of them particularly bare of vegetation, should have been visited by the birds to the extent they have been. This, however, is not so surprising as at first it would appear, for naturally there is more concentration, and less diffusion, of the arriving birds on the small islands than on the large, or on the mainland, and they are less likely to pass unobserved than when spread over a larger expanse of country.

Although met with in almost every description of country, whether mountainous or plain, the pine and fir districts have naturally attracted the wanderers more than others, and

held them for a longer period. In those districts where food has been plentiful, and the birds have been unmolested, they have settled down, and, in many cases, remained for a considerable length of time. The 'Field' of December the 4th contains an interesting note recording the abundance of Crossbills (*L. curvirostra*) in West Sussex and mentioning the fact of a small party of the birds having daily, for the space of two or three months, frequented and fed on the cones of a large Douglas-fir at Leonardslee, under which tree were to be seen quite five barrow-loads of stripped cones lying in heaps! The fir-tract of country in this neighbourhood is ideal ground for the species, affording abundant nutriment, and it is not surprising that the birds should have chosen to linger there so long.

While on the subject of food, it may be observed that the recent invasion has afforded interesting cases of Crossbills feeding upon many substances which we should not have imagined would enter into their diet, and which under ordinary circumstances would probably not do so. In addition to the seeds of all species of conifers indiscriminately, the birds have been observed feeding on many kinds of orchard fruit, the seeds of various grasses and low-growing plants, as well as on the actual flowers of some plants and on the Aphids of different species. A correspondent writing from Lombardy comments on the unusual spectacle of large flocks of Crossbills feeding in the open fields in the neighbourhood of Como. As to the duration of last year's Crossbill invasion, it may roughly be calculated to have extended over a period of about six months, having commenced in the spring and lasted until the autumn, although a certain number of the birds appear to have remained in some localities much later and even into mid-winter.

As may be gathered from the recorded observations, there seems also to have been a considerable variation in the date of the first appearance of the Crossbills in different countries, but this is not to be wondered at. Allowance must be made for the probability, not to say the quasi-certainty, of the first arrivals having passed unobserved in many

localities, and generally for a lack of properly recorded observations.

The following statistics which I have obtained regarding last year's Crossbill invasion are fairly ample in some few cases, but very meagre in others. Those from Italy I give at greater length than those from other countries, from which detailed reports have either already been published or will probably be so shortly.

British Isles.—Judging from the statistics given in 'British Birds' (vol. iii. pp. 82, 123, 162, 190–194, 226–228), and from reports published in other periodicals and newspapers, the Crossbill-invasion of 1909 was fairly conspicuous throughout a considerable portion of our country, the eastern, and more particularly the south-eastern counties, as well as the small islands off the Scottish coasts, having apparently been visited by the wanderers more than other parts. The mainland of Scotland, Ireland, Wales, and the extreme south-western portion of England appear to have been the least visited by the Crossbill, although even from these districts a few cases of its occurrence have been reported, and no doubt many more have escaped notice and remained unrecorded.

On the whole, it may be said that the wave of the Crossbills' erratic migration spread practically over the whole of the British Islands, having been more marked in the eastern than in the western portion of the Kingdom.

The first arrivals of the bird appear to have been observed towards the end of June, from which date onwards, throughout the summer and autumn months, the species was met with, in greater or lesser numbers, in most parts of our country.

At Fair Isle the earliest arrivals were observed on the 23rd of June; the numbers of birds that swarmed on this small island were very great, as many as 300 being seen some days. The same may perhaps be said of the Shetlands and Orkneys.

There can be no doubt whatever that, with the exception

of a very few cases, all the Crossbills that have come to our shores across the North Sea belong to the typical continental form, *L. curvirostra*, or *L. curvirostra typica* for those who adopt trinomials. Occasional examples of the Two-barred Crossbill (*L. bifasciata*) have been met with among the flocks of the commoner species, and a few specimens of this more eastern Crossbill are recorded as having been obtained, notably at Fair Isle and in the Flannan Islands.

The greater number of the recorded occurrences of Crossbills in the British Isles having been carefully detailed in 'British Birds,' it is hardly necessary to recapitulate them here.

France.—As was to be expected, last year's invasion of Crossbills extended westward to France, although its expansion and numerical importance there were apparently less considerable than further eastward and throughout the Central European countries. It also seems to have been somewhat more marked in the east of France itself than in the west, but this perhaps is not surprising.

To the kindness of Dr. Louis Bureau, Director of the Natural History Museum at Nantes, I am indebted for the following interesting particulars regarding the occurrence of the Crossbill in some of the French departments.

Côte-d'Or.—According to M. Paul Paris, Crossbills were first observed by him in this district about the middle of August, and frequently after that date. On the 18th of October he received an example of the species, in the flesh, from Dijon.

Aube.—Crossbills are reported as having been observed in this district about the end of August. Both here and in Côte-d'Or the species is of irregular passage, and had not been previously observed for three or four years.

Haute-Saône.—M. Paris received three examples, in the flesh, from this district about the end of September, and saw a flock of Crossbills settled on a fir-tree opposite the Autun Museum on the 11th of October.

Haute-Marne.—M. Paris received an example from this district on the 27th of October, from which date until the

end of November he says hardly a day passed without Crossbills being observed there.

Sarthe.—According to M. l'Abbé Lamoureux, many Crossbills were observed in this district on the 8th and 9th of July, a single individual of the species on the 20th of September, and a few on the 14th of October.

Vendée.—M. Plocq reports having obtained an example of the species near Roche-sur-Yon, and having observed small flocks on passage in this district.

Loire-Inférieure.—A nephew of Dr. Bureau obtained an example out of a small party of the species that had remained in the neighbourhood of Birochère, in this district, between the 8th and 15th of August.

The 'Revue française d'Ornithologie' of Paris very sensibly opened an inquiry last autumn regarding the recent Crossbill invasion, and collected several interesting notes, some of which are comprised in the remarks given above.

In the January (1910) number of that journal, a copy of which has kindly been sent me by M. Louis Denise, M. F. Daguin states that Crossbills had never been so abundant in the Côte-d'Or as they were last autumn, and particularly in the month of November, when the birds were to be observed in large numbers in many localities of this department, and particularly in the Chatillon-sur-Seine district.

M. Lomont reports Crossbills having been seen, in greater or lesser numbers, at Manonville, Meurthe-et-Moselle, between the 10th of July and the end of September, after which date some were again observed on the 10th of October and on the 15th of November.

M. Roger Reboussin mentions having seen a pair of Crossbills at Sargé (Loir-et-Cher) on the 13th of November. Considerable numbers of the species are also reported as having been observed in the neighbourhood of Cete in the south of France.

Belgium.—Crossbills are reported as having been numerous in several parts of this country during the past year, but I have no special information on the subject. The species

is not a common one in Belgium, and is of irregular passage there.

Netherlands and Denmark.—What I have just said regarding Belgium will probably also apply to the Netherlands and Denmark.

Germany.—The recent invasion of Crossbills appears to have been of considerable magnitude and to have spread generally throughout the whole or greater portion of Germany. According to reports published in the 'Ornithologische Monatsberichte' and from information received from other sources, large numbers of the species were observed in many districts from the middle of June onwards throughout the summer and autumn. Among such districts may be specially mentioned the coast-regions of the North Sea, Heligoland, the East Frisian Islands, Pomerania, Hanover, Brandenburg, the Rhine Provinces, Saxony, Bavaria, Württemberg, and Baden. No doubt there have been other districts and localities where the incursion has been very noticeable, but detailed information concerning them, and regarding the invasion generally, will probably be forthcoming in later numbers of the above-mentioned journal and in other publications.

Switzerland.—As regards Switzerland Dr. Goeldi, of Berne, in reply to my inquiries, has kindly sent me a copy of a paper by Dr. H. Fischer-Sigwart, of Zofingen, published in the Verhandlungen of the Schweiz. Naturforsch. Gesellschaft for 1909, which contains an excellent account of the invasion of the Crossbill into that country. It is sufficient to say that in 1909 it was observed in many Cantons of Switzerland, and in some places in large flocks. It is said to have nested in July near Zofingen, and in other places.

Austria-Hungary.—The Crossbill invasion appears to have been conspicuous throughout the greater portion of these countries, and vast numbers are reported as having been observed in many districts.

A report on the subject, published in the Hungarian ornithological journal 'Aquila' for 1909, a copy of which

has been kindly sent to me by Dr. Otto Herman, gives some interesting particulars regarding the incursion in Hungary. After a few remarks of a general character and concerning the occurrence of the Crossbill as a resident and breeding species in the Carpathian Mountains and in other parts of the country, a list is given of the various localities from which reports had been received, in response to the invitation which had been issued by the Hungarian Central Bureau for Ornithology. From these reports it is evident that the recent invasion was on a vast scale in Hungary, and that it extended generally throughout the country, having commenced in June, reached its height in July, and continued until the late autumn. With the exception of a single specimen of the Two-barred Crossbill (*L. bifasciata*), obtained in the district of Arva, and a few other individuals of that species reported as having been observed in the vicinity of Zotyom, the wanderers appear to have all belonged to the common species, *L. curvirostra*.

Allusion is made to the scarcity of cones on the pine- and fir-trees in Hungary during the past season, and some interesting information is given regarding the various substances, other than such cones, on which the Crossbills had been observed feeding.

From Galicia, Bohemia, Salzburg, the Tyrol, and the Trent districts, Crossbills are reported as having been observed as more or less plentiful throughout the past summer and autumn. In the last-named district the incursion seems to have been particularly marked.

Prof. A. Bonomi, of Rovereto, writing in a local periodical last June, reported eight individuals of the species as having been seen at Madonna del Monte, near Rovereto, as early as May 30, and alluded to the possibility of this being the prelude to an abundant passage of the birds. He was not wrong, for from that day forward the wandering Crossbills continued to arrive in gradually increasing numbers, the invasion at last assuming such proportions as to constitute a veritable phenomenon.

In a paper on the subject, dated August the 12th, published

in the Italian journal 'Avicula,' Prof. Bonomi gives some interesting particulars regarding the invasion, which he had collected from his friends in various parts of the Trent district. According to his account, the birds not only visited the neighbouring woods, but invaded the village gardens and orchards, even perching on the houses in some cases. The poor birds, however, naturally remarkably tame and confiding, seem to have met with scant hospitality, and large numbers of them were killed or captured alive, over 500 individuals of the species having been sold one day at Ronzo. Occasional examples of the Two-barred Crossbill (*L. bifasciata*) appear to have been met with among the flocks of the common species. From what Prof. Bonomi says, no invasion of like proportions had ever been known in those parts before, although the Crossbill appears to be in the habit of visiting the district in certain numbers every three or four years, and in the years 1889 and 1905 was abundant. Prof. Bonomi alludes to the scarcity of cones on the pine-trees in his neighbourhood, and adds that in some districts the conifer forests were absolutely bare of fruit.

From a letter from Prof. Bonomi I learn that the passage of Crossbills continued throughout the autumn.

Italy.—The Crossbill invasion of 1909 was on a vast scale, and, so far as can be remembered, of unprecedented numerical importance throughout the greater part of the country, exceeding in quantity all previous incursions of the kind experienced of recent years. Not only has it spread throughout a considerable portion of the peninsula, but it has also extended to most, if not all, of the Italian islands, both large and small, and even to Malta, which is considered as part of the Italian zoogeographical region.

Naturally, some districts have been visited by the wandering birds in greater numbers than others, owing to their being situated on the direct line of flight, or for other reasons; and, naturally also, reports and observations from the more thinly populated districts of the south of the peninsula have been fewer and more meagre than from many other parts; but, making due allowance for these circumstances, the invasion

may be looked upon as having been fairly general throughout Italy, with the exception of its extreme north-western portion.

Somewhat unaccountably, and strange as it may seem, Piedmont does not appear to have been visited by the Crossbills as other parts of the kingdom have been during the past year. This is all the more surprising considering the alpine character of its northern boundary and the large tracts of fir-clad country it possesses. My personal experience, however, confirms the general report, for during a period of five weeks which I spent in the Val d'Aosta last summer, although constantly on the look-out for birds, I never once saw a Crossbill, nor could I learn of any having been seen by others during that time. The species is, however, said to be resident in some of the northern districts of Italy, and I understand that it breeds in some parts of the Val d'Aosta itself.

It has also been said to breed in some of the higher districts of the Apennines, although hitherto this statement has, by some authorities, been considered doubtful. There would, however, appear to be unquestionable evidence of the bird having bred during the past year in the provinces of Emilia and Tuscany. One case of such breeding is recorded by Count Filippo Cavazza, in the 'Bulletin' of the Italian Zoological Society for 1909, as having occurred, in May, in the gardens of Prince Hercolani near Bologna; another instance has kindly been notified to me by Count Arrigoni degli Oddi as having occurred, also in the month of May, on an estate belonging to the Marchesa Paulucci-Panciatichi, near Vallombrosa.

To the eastward of Piedmont, and throughout the Italian lake-district and the valley of the Ticino, the incursion of Crossbills was very considerable, large numbers of the species having been observed in several localities from the middle of June onwards until September.

So far as regards the remainder of Northern Italy, from information which has kindly been communicated to me by Professor Martorelli and Count Arrigoni, I gather that the

invasion of Crossbills was very noticeable throughout many districts of Lombardy, Venetia, and Emilia during the months of July and August, and that considerable numbers of the birds were killed or netted during the latter month, when the close season had expired. The height of the passage was then past, however, and the number of fresh arrivals was rapidly waning, although even throughout September and October a few continued to be seen.

Out of a large number of Crossbills which had been netted at Alzate, in the Brianza district, Prof. Martorelli mentions having seen an example, a fine male, which in coloration and marking answered to Schlegel's description of *L. rubrifasciata*, but he seems to think that this may be merely the fully adult form of *L. bifasciata*, of which species he had been given to understand other examples had been captured in the Brianza district.

In Milan and other Italian towns it has been a common sight during the past summer and autumn to see Crossbills in cages. Few species adapt themselves to confinement so easily as the Crossbill does.

Count Cavazza, in the journal above mentioned, gives some interesting particulars regarding the incursion of Crossbills in the Emilian province, and more especially in the vicinity of Bologna, where a few of the species, the vanguard of the wanderers, appear to have arrived as early as the first fortnight of April. These were followed by considerable numbers towards the end of May, and by still larger numbers about the middle of June, after which date the passage began to diminish in intensity, although the birds apparently established themselves in the pine-woods which are abundant in that neighbourhood, and remained there for several months.

Count Cavazza points out what is, no doubt, a noteworthy feature in the recent Crossbill invasion, viz., the early date of its commencement, for, as a rule, the irregular visits of this species to Italy are effected during the late summer and autumn months.

Speaking of the extraordinary tameness of the species, he

says that he had frequently known a shot fired at a party of these birds perched on a tree, and some of their number killed, without the survivors taking flight. What is still more surprising, however, he states that he once saw some Crossbills feeding on a fir-tree which was being felled by the woodcutters, and that on the branch on which the birds were perched falling to the ground they followed it there and continued their meal, in no way disconcerted.

In Liguria, according to Prof. Regalia, large numbers of Crossbills were observed during the month of September, and notably in the neighbourhood of Cornigliano and Sestri Ponente. Further west, and along the Italian Riviera, the species appears to have been abundant in the autumn, and even as late as the end of October.

I am indebted to Signor Cesare Ragionieri, of Florence, for some interesting notes regarding the incursion of Crossbills in Tuscany and the Marche. The first arrivals in these provinces appear to have been noticed about the middle of July, and from that date onwards, until the end of August, the passage of the birds continued more or less plentifully. After that date it gradually decreased.

In the neighbourhood of Leghorn and Pisa, and along the Maremmana coast, Crossbills were observed in extraordinary numbers throughout a portion of the summer and until the beginning of October.

Signor Ragionieri speaks of the arrival of the birds in the vicinity of Rimini, on the Adriatic coast, as being "simply phenomenal," and mentions the case of a local birdcatcher having snared no less than one thousand of them within the space of about a month! Although in some parts of the country the close-time appears to have been respected, in many others it was unfortunately not so, and vast numbers of the poor birds consequently fell victims to the nets and traps set for them, their excessive tameness rendering their capture an easy matter.

Signor Ragionieri himself frequently observed the Crossbills arriving of a morning, in flocks of varying numbers,

and states that they always came from the south-east and proceeded in a north-westerly direction.

Signor Coli, of the University of Rome, also alludes to the great abundance of Crossbills on the Adriatic coast, and notably in the neighbourhood of Tronto and Ascoli-Piceno in the Marche. According to information received by him, the species was first observed in those districts early in June, and continued in evidence there until the end of August, after which date it was not often seen, although it did not entirely disappear until October.

During the period that the birds remained in these localities they took up their quarters in some pine-woods, where they congregated in large flocks of from 300 to 400 individuals, sallying forth daily to drink at the water-courses made by the country folk for the purpose of irrigation.

Throughout the province of Latium and the Roman Campagna, as well as in the immediate vicinity of Rome itself, Crossbills appear to have been frequently observed during the summer months.

From the more southern provinces of the peninsula reports regarding the recent invasion have been few and far between, but, from personal inquiry, I have ascertained that considerable numbers of Crossbills were observed in the neighbourhood of Naples during the early summer, and it is presumable that the same will have been the case generally throughout the country still further south.

Around Bari, on the Apulian coast, the species is reported as having been extraordinarily abundant on the 12th of July, and it is also stated as having been numerous at Polignano and Triggiano on the same coast.

In Calabria it is also reported as having occurred abundantly, and particularly in the neighbourhood of Cotrone, Catanzaro, and Reggio during the months of July and August.

Coming now to the Italian islands, and commencing with Elba, as having been the first in which the Crossbill invasion of last year was observed—or, at any rate, from

which it was signalled, the news having been communicated by a telegram from Portoferraio to a leading Roman newspaper,—it would appear from articles published by Prof. Giacomo Damiani in 'Avicula,' and in a local newspaper, that the incursion was noticeable throughout the entire island, commencing early in July and continuing throughout that month, although constantly and rapidly diminishing in intensity. Prof. Damiani adds that a good many of the birds reappeared about the middle of August, disappearing again shortly afterwards. He further states that it was twenty years since the species had been first observed by him in Elba, and that he had never known anything to equal last year's invasion.

From Corsica I have received no information on the subject, but there can be little doubt that the invasion extended to that island.

In Sardinia, according to information received from Sig. P. Bonomi and other correspondents, large numbers of Crossbills were observed in various parts of the island, and particularly in the vicinity of Cagliari, during the summer and autumn, and even as late as the month of October.

On the island of Capri, from information given me when passing through Naples in July last, I ascertained that considerable numbers of the species had been seen during the first fortnight of that month. According to more recent information received by Signorina Picchi, of Florence, the species reappeared on the island of Capri in large numbers in the month of August, but did not remain there long, which is not surprising, considering the lack of trees on the island and the persecution which the birds meet with there at the hands of the natives.

In Sicily the Crossbill invasion was very noticeable in various districts, and more especially in the north-western portion of the island. Although numerically it was perhaps less important than in some more northern countries, there can be no doubt that a very large number of the birds reached this southern latitude, and what is also very noteworthy is that many of the birds continued to be observed in the

island until quite late in the year, some of them indeed having actually been seen in the neighbourhood of Palermo in January of the present year. As a rule, the very irregular and fitful appearances of the Crossbill in Sicily occur during the late summer and autumn months, and the species is not seen there in winter.

The first arrivals of Crossbills in Sicily last year appear to have been noticed early in July. One of my gardeners at the Villa Malfitano, near Palermo, reported having seen some of the species on the 3rd or 4th of that month. On the 10th of July I myself observed several Crossbills in my garden, feeding on the pine-trees (*Pinus maritima*) which are plentiful there, and I secured a few specimens of them. The birds were in small flocks of from half a dozen to twenty individuals, young of the year predominating. On the 11th of July some of the birds were again observed in my garden, but in diminished numbers, and during the next few days the species was only observed occasionally. During the first fortnight of July the weather at Palermo was exceptionally cool for the season, northerly or north-westerly breezes prevailing most of the time. On the 10th of July the breeze was particularly fresh.

According to information received from various sources, Crossbills were seen in considerable numbers on the 10th and 11th of July throughout the entire plain of Palermo, as well as in the neighbouring districts. About that date they appear to have also been observed in the vicinity of Trapani and Marsala, whence examples of the species were forwarded to me. Towards the end of July a good many individuals were reported as having been seen at Syracuse, as well as at Lentini and other localities on the east coast of Sicily.

Later, during the month of August, fresh arrivals of the species were observed throughout the plain of Palermo, as also in the more inland districts of Corleone, San Giuseppe d'Jato, and Piana dei Greci. Crossbills appear to have been observed, at intervals, throughout the entire month of August in the neighbourhood of Palermo.

In September they were absent, or, at any rate, I have no note of any having been met with in Sicily during that month. In October, however, they were again observed in considerable numbers near Palermo, several of the birds having been seen in my garden between the 15th and 20th of that month. No examples of the species having been observed in the month of November, and the invasion having naturally been supposed to have ended, it was somewhat of a surprise to hear of fresh arrivals of Crossbills near Palermo towards the end of December. According to information recently received, I learn that a few Crossbills were seen in my garden at the Villa Malfitano on the 29th of December, and again on the 1st of January, and that several individuals of the species had been observed, and examples obtained, in the vicinity of Villa Grazia, near Palermo, on the 3rd of January, 1910.

Among the number of Crossbills which have been shot or captured in Sicily during the recent invasion, so far as I am aware, there have been none belonging to the Two-barred species, *L. bifasciata*, or to any but the common form of *L. curvirostra*.

On the small island of Ustica, about forty miles to the north of Sicily, Crossbills were observed in July.

On the island of Favignana, one of the group of the Ægades, lying off the north-western corner of Sicily, large numbers of Crossbills were reported as having been seen on the 10th of July, and two examples of the species were sent to me from that island a day or two afterwards. In August the Crossbills appear to have again visited Favignana in considerable numbers.

Of the occurrence of the species in the island of Malta I have received the following interesting particulars from Mr. Henry Twelves:—"About the 9th of July last Crossbills appeared in flights of about ten or fifteen each, and were abundant for about a week on the north and east sides of the island. They subsequently collected wherever pine-trees were to be found. Many were trapped, some very young, and very few males in full red plumage. Towards the end of August

very few remained. They seem to have reappeared in small numbers in October. Northerly winds prevailed at the time they arrived, and fresher than in former summers. Another informant tells me that altogether about seventy must have been trapped, and that it is about twenty-six years since these birds last visited the island. Some attribute the visitation to the extraordinary prevalence of strong northerly breezes last summer."

From Greece and from countries lying to the eastward of the Adriatic I have no information on the subject, but it is very probable, I think, that the wave of the great Crossbill-migration extended in this direction also.

In the neighbourhood of Constantinople, however, according to information kindly given me by Colonel Elia, of the Italian Embassy, and Mr. Eyres, our Consul General, it would appear that nothing had been noticed in the way of any unusual passage of the species during the past year.

Passing from the east to the extreme west of our Continent I will conclude with

Spain and Portugal.—From the scanty information so far received from these countries, it appears to be uncertain whether last year's invasion of Crossbills extended so far west.

With regard to the former country, reading the account given in 'British Birds' (vol. iii. pp. 192-193) of Crossbills having been observed in Andalusia last July, I felt inclined to believe that the incursion of the species from the north had undoubtedly reached as far as that region, but a footnote informed us that two specimens of the Crossbill met with in Andalusia, which had been forwarded for identification, proved to be of the distinct Spanish form *L. curvirostra hispana*, and that this incursion of Crossbills into Andalusia had therefore no direct connection with the irruption from Northern Europe.

So far as regards Portugal, the only information which I have been able to obtain regarding the appearance of Crossbills last year in that country I owe to the kindness of Mr. Wm. C. Tait and his brother, Baron Soutellino, of

Oporto. According to Mr. Wm. Tait, the Crossbill is a rare and occasional visitor in Portugal, merely appearing at irregular intervals. He informs me that a few individuals were observed in a garden near Oporto in November last, and that a friend of his at Coimbra University, between Oporto and Lisbon, had informed him that a large number of Crossbills arrived there in October, some of the birds being still in the neighbourhood at the time of his writing. Unfortunately no specimens had been secured, and on Mr. Tait writing to endeavour to obtain some, it was too late, for the birds had all disappeared. This is to be regretted, as it would have been interesting to have been able to establish the identity of these birds, and to know whether they formed part of the great invasion from North Europe, or whether they belonged to the local Spanish form, which is perhaps also resident in some parts of Portugal.

XV.—*Obituary.*

DR. R. BOWDLER SHARPE.

RICHARD BOWDLER SHARPE died at Chiswick on the 25th of December, 1909, at the age of sixty-two. To the general public he was best known as the head of the Bird Department of the Natural History Museum at South Kensington, though, strictly speaking, this was not the official designation of the post which he so long occupied. To students and fellow workers throughout the world he was much more than this; for his profession was his hobby, and he worked at it with such unremitting energy and devotion as to distance all competitors in the amount and quality of the scientific work which he achieved. In his study of the vast collections under his charge he acquired an unrivalled knowledge of the bird-life of the world, estimated to include more than 18,000 species, almost any one of which he could name at sight, except in the case of closely allied forms, which would necessitate comparison with others. Further than this, he could tell